October 4, 2001

# Memorandum

To: FHWA Docket No. FHWA-2001-8954

From: Wade F. Casey

Subject: Response to the NBIS questionnaire

1. On April 18, 2001, the Federal Highway Administration (FHWA) Office of Bridge Technology sent out a questionnaire to the bridge community within the FHWA to solicit comments regarding 23 CFR 650, subpart C, National Bridge Inspection standards (NBIS). It asked the basic question: does the NBIS regulation need to be revised? The comments that follow are remarks made to questions posed within this questionnaire. This document is provided for information purposes to docket number FHWA-2001-8954.

2. The FHWA received a total of 43 responses to its questionnaire. We have summarized those responses in this packet.

3. Some commenters have made remarks regarding the recording and coding guide for the structure and inventory and appraisal of the nation's bridges (FHWA –PD-96-001) and did not address the NBIS regulations. These comments are included even though they are outside the scope of the questionnaire.

4. 79% of commenters thought there is a need to revise the NBIS.

5. 56% of commenters thought their customer (in most cases the State) wanted to see the NBIS revised.

6. 51% of commenters thought the way the NBIS is currently written is **not** too restrictive and 23% thought it is too restrictive.

7. Lastly, 38% of commenters thought the way the NBIS is currently **not** too loose while 36% thought **yes** it is too loose.

8. The names of the commenters have been omitted for privacy reasons.

**Note to reader**: Comments that follow are a compilation of comments received in response to the NBIS questionnaire. This questionnaire asks the basic question, does the NBIS need to be revised? This compilation of comments are unedited and shown in the order of receipt. These comments are based solely on the commenter's remarks to the question that precedes the comments which is repeated here for your convenience.

**1. Is there a need to revise the National Bridge Inspection Standards? □ Yes, □ No, □ I do not know.**

| No. respondents | Yes | | No | | Don't Know (DK) | | No Comment (NC) | | Non responsive (NR) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 43 | 34 | 79% | 5 | 12% | 1 | 2% | 1 | 2% | 2 | 5% | | |

**1a. If the answer to number 1 is yes, can you briefly state why?**

Additional Coding Fields are needed. Allow Civil Engineering degree to count towards experience for team leader qualification._(not complete qualification, but partial

650.307, qualifications, is too restrictive in some cases and does not get the job done. Also, 650. 303, e, 1, and 2 needs their dates revised.

1) Clarify qualifications of inspectors, inspection teams, 2) Modify qualifications of inspection field team leaders, 3) Modify language for 2 year frequency, 4) Further define "public roads", and require inspections for those roads open to some of the public, some of each year.

Changes are needed in Load rating requirements, special inspection requirements, element level inspections, and add QA requirements to the CFR.

1) It is difficult to work with metric units. Our state has never used metric units. 2) There is no provision to indicate a structure that has been constructed with a design exception. 3) The current database does not maintain a history of bridge inspection condition ratings.

Facilities are aging and deteriorating, as such there is a lesser factor of safety. Therefore it would seem appropriate to have a registered engineer in charge to evaluate any deterioration observed.

For the most part, the existing NBIS satisfies the needs of the bridge owners. The existing system should continuously be reviewed, updated and problems addressed.

The NBI does not currently reflect bridge conditions relative to scour or seismic event susceptibilility.

It has been well documented by not only FHWA but other states as well, that the term sufficiency rating (SR) is outdated and misused. 20 – 25 years ago SR may have been adequate for a snapshot measure of a bridge's ability to remain in service. The primary deficiencies we have concerns about have already (been) documented and are shown below: SR is too heavily weighted towards structural deterioration. SR does not have adequate balanced weighting for functional use such as ADT and bypass length. Another deficiency is the exclusion of bridge attributes for risk such as scour and seismic susceptibility. Although not mandated as was planned in ISTEA, most states saw the need for a bridge management system (BMS) even though some complained about the initial deadlines. Today however, a few states have actually developed bridge programs for several years using

BMS and most others are getting close. This means that with BMS there is a tremendous amount of data being collected that could be useful to FHWA in revising how it monitors the nation's bridge infrastructure, determines apportionment and eligibility if still desired by the FHWA.

23 CFR 650 Subpart C is generally a complete document, providing sufficient direction for maintaining an effective bridge inspection program without being too general or too restrictive. My recommendations for changes are provided below.

1. Increase the flexibility regarding structural inspection (not scour) of underwater elements. 2. – Clarify 650.311(b) to indicate that modification of existing structures includes changes in ratings and not just physical action to modify a bridge.

There is some lack of clarity that has contributed to problems of interpretation over the many years that the regulations have remained relatively unchanged. Also, there have been several areas where FHWA's oversight of bridge safety has been criticized by the Office of Inspector General and others. While FHWA made operational responses to most or all of the criticisms, the regulations have not been updated to reflect FHWA policy and the best practices of States.

Several sections of 23 CFR 650 have outdated references or are in need of clarification.

The NBIS are pretty good as is, but do need some updating. Most of the references are outdated and some are out of print. The Bridge Inspector's Training Manual is under revision at the present time. An issue which should be revisited is that of inspector qualification. The current standards do not define the qualifications for an inspector, but only those for team leaders and persons in charge. A more explicit defining of the minimum qualifications for inspectors (as contrasted with technician assistants) would seem to be an appropriate revision.

a. We need something to address consistency. When different people look at similar bridge conditions they don't get the same rating.
b. We should provide criteria for the less than 2 year inspection frequency in the regulation. Very few bridges are inspected at less that 2 year frequency if it is left up to the person in charge of the inspection program and it opens it up to inconsistency between States.
c. It should provide guidance on what critical findings are and what should be done about them.

The Program should identify structures at risk of significant seismic damage similar to scour, fracture critical, etc.

There are areas of the inspection standards that need further clarification.

The standards need to be updated to account for the years of experience we now have with bridge inspection and to consider advances in technology.

PA: At this time, we are not ready to make specific recommendations for revisions to the NBIS. We believe there are a number of areas that warrant review. These areas are listed in Item 2.

There are several areas where editorial changes are necessary. Large changes – adding items and deleting items -- are probably not necessary.

There are numerous areas where the current NBIS is not clear or that are not addressed; a few specific areas are that inspection responsibilities are not clearly defined & stated, quality measures are not specified, inspector qualifications are not clear and inadequate, and electronic record keeping is not addressed.

Some references need to be updated and the Forest Service would like to change the bridge definition.

Section 650.311 includes provisions for maintaining a database of structures within the state even though the responsibility for Federal structure inspections is the Federal agency responsibility. The state has no responsibility to assure the inspection information is correct or current.

Majority of bridges on FWS facilities are low useage which are not adequatcly addressed by current standards.

The NBIS is 30+ years old. It will be a good opportunity for FHWA to conduct a review to improve it.

I will also suggest to create an item for rideability (smoothness). This is a FHWA goal and I don't think that the bridge rideability is included when the pavement rideability is measured. By rating the bridge rideability the state can quantify the area / costs to correct (rehabilitate) bridges having problem with rideability.

I think after living with the current manual for five years, the flaws with different items have been identified, and can now be mitigated.

For the most part, the NBI is a clear regulation. But some areas need to be clarified, as per below.

Outdated Manual and section references. Need for clarification. Policy interpretations.

In recent years, program has changed significantly with developments in BMS, inspection technology and flexibility in standards. We need to move toward more reliance on BMS and emphasize preventative maintenance initiatives and standards in order to encourage prolonging service life of bridges.

The condition codes are interpreted differently and can vary greatly among inspectors. The coding guide is too vague. The inventory items and descriptions don't fit a lot of actual bridge design details.

Various NBIS Compliance memos should be reviewed as part of this process and added to 23 CFR 650 as appropriate. Please see comments from Division partners at the New York State Department of Transportation.

Too many unclear items are leading to nationwide non-uniformity. We should not let States interpret items their own way to benefit their own states. The "S" in "NBIS" stands for "Standards" and I don not believe we are doing things in a standard manner.

To become consistent among all agencies involved.

**2. What proposed changes would you recommend?**

Add a data field for seismic rating similar to Item 113 scour). B. Add data fields for prioritization of scour and seismic countermeasures. C. Make Seismic data a part of the bridge's sufficiency rating and structural deficiency or functional obsolescence

650.303,e,1 and 2 should each have a time frame like (2) does now. However that time frame should be a multiple of the 2 year frequency for routine inspections, say fracture critical and diving inspections every 6 years.

650.307, qualifications needs to be rewritten. Being a professional engineer alone is not enough. A PE who majored in electrical or chemical engineering could inspect bridges. Not what we want. Also, the person in charge of the program, does not need inspection experience or structural expertise. They do need to be aware of how the program should operate, and its importance. This could be handled in a 1 to 3 day training course. The inspection team leader does need to have structural experience. However, this could be gained designing or building bridges or other structures, as well as inspecting them. The comprehensive course is a must and needs to stay in for inspector qualifications. What does the 5 years experience mean. One bridge a year for 5 years, full time for 5 years, or something in between. Since the training course is 2 weeks, I would suggest something similar for the experience. 80 hours, one month, etc. While large bridges take a lot of experience, small county, city, rural bridges can be inspected with minimal experience. There should be a way for counties/townships to inspect their own bridges without such rigid requirements. Someone should be able to do bridge inspections with a reasonable amount of training plus experience, say total of 1 to 6 months. Since routine inspections are primarily visual, the inspector should meet some requirements for vision, and also have the ability to walk/climb/whatever to get close to the various parts of the bridge. There should be an added section for inspection team member. Training through the course or by the team leader for specific tasks.

1. Modify qualifications for inspection field team leaders. Most states and agencies are using technicians predominantly as field leaders, mostly because they can't afford or can't get willing PE's. This leads to problems with the reliability and accuracy of the inspection data. This is a serious problem that should not continue; there is a better way! There should be an additional qualification for graduate civil engineers with say, 2 years of bridge experience, to qualify with proper training. This is a huge untapped reservoir of talent. This is also great training for young engineers. Some States/ agencies use this practice, as it is sometimes the only practical way to get adequately knowledgeable people out on inspections. Let's make it legal!

2. Modify language for the 2-year inspection frequency. Recommend the 'not to exceed 2 years' be changed to 'not to exceed 26 months for any inspection cycle, and a 24 month average over multiple inspection cycles'. This would eliminate the practical problem encountered by **all** States and agencies when each 2-year inspection would have to creep forward slightly each year, until inspections would be performed in an entirely senseless time of the year, to strictly comply with the existing wording. Again, no one strictly adheres to this requirement as worded; lets make it legal!

3. Further clarify 'public roads', 'qualifications of personnel', and inspection 'teams' Recommend that public roads should either be defined as, or the NBIS require inspections for, any roads open to any part of the public at any time of the year. For the safety of the public, and to close loopholes, this only makes good sense.

Recommend that under 'qualifications of personnel', that the 'individual in charge of the organizational unit' and '...charge of an inspection team' be clarified. This is currently very vague and is abused by most States.

Recommend that inspection 'teams' be clarified to mean a minimum of 2 persons to a field team.

1. Define load ratings as being by analysis, or load testing, and make it clear that "presumptive" ratings are not acceptable. 2. Require special inspections of movable span bridges electrical and mechanical systems on a 5 year cycle. 3. Require element level inspections using AASHTO core elements. 4. Include a QA requirement for independent verification of a representative sample of inspections in the CFR and require that each inspector participate in the QA program to help achieve consistency in ratings and procedures.

Changes are needed in Load rating requirements, special inspection requirements, element level inspections, and add QA requirements to the CFR

Can we include the ability to withstand earthquake loading, a factor in the NBIS deficiency determination. In other words, if a bridge was designed and built to a lesser standard several years ago, and now the earthquake loading requirements have been increased, can that bridge be considered structurally deficient?

1) Revert back to U.S. standard units. 2) Provide a data field for bridges with a design exception. This will clarify why some new or rehabbed bridges are functionally obsolete or have a low sufficiency rating. 3) If a history of maybe the last five bridge inspection condition ratings are provided the rate of deterioration and the consistency of inspections can be easily determined.

Place a registered professional engineer in charge of the organizational unit and also be a team member. He should be on site to evaluate any deterioration observed by other team members.

We have had a number of projects where the bridges needed to be retrofitted for seismic. The cost to retrofit is nearly the same cost as to replace, however, the SCDOT didn't want to replace bridges having sufficiency ratings in the high 80s or 90s. I think that including the scour and seismic susceptibility in the rating of the bridges will assist in future decisions.

Eliminate SR and use the CALTRANS model for health index (HI). Combine the HI with functional use, levels of service criteria and risk assessment factors. This revised measurement criterion would apply in determining apportionment, and eligibility, it still desired by FHWA. Then a state could apply the funding where needed. The HI portion of this is consistent with the Asset Management Reporting Requirements of GASB Statement 34.

There are four changes that I would recommend.

1) Rating procedures should be updated to be consistent with the AASHTO LRFD Bridge Design Specifications. Load and resistance factors should reflect consistency of reliability for the loads and conditions encountered in existing bridges.
2) Sec. 650.305 paragraph (c), change "state" to "bridge authority". For bridges owned and operated by agencies other than a state, the agency must submit proposals for increased inspection intervals through the state in which the bridge resides, and then the state submits the request to the FHWA. This seems like a redundancy of effort and an unnecessary layer of bureaucracy. The state should be aware of the change of inspection interval if the bridge is part of the state route but does not need to be involved in the approval process.
3) Mailing addresses for publications should be supplemented with web site addresses where available.

4) The Corps of Engineers owns many bridges that are small, lightly used, and remote. Strict compliance with the NBIS leads to an expensive and inefficient program. Inspection and evaluation procedures established by the NBIS are intended for more heavily used structures. Inspection and evaluation requirements should be relaxed for bridges of low use minor consequences of failure.

1. – Revise 650.303(d)(2) to allow owners the flexibility to extend the interval for structural inspection of certain elements by divers to more than 5 years. 2. – add " or changes in condition" after the word modification in 650.311(b).

650.301 This section should clarify whether NBIS apply to bridges carrying vehicular highway traffic only or if the intent is to cover non-vehicular bridges such as pedestrian bridges. The phrase "...a track or passageway..." is rather archaic language and should be updated.

650.303 The section should clearly state the State Transportation Agency is responsible for the timeliness and accuracy of all State bridge inspections and that of any local government operating within the State. It should also be made clear that Federal agency owned bridge inspection is the responsibility of the owning agency.

Master lists required for fracture critical structures, bridges that require underwater inspection with special apparatus and bridges with unique features should specifically require a list of scour critical bridges. FHWA has undertaken a major initiative in scour evaluation, analysis and countermeasures for the last 10 years without one additional word in regulation.

650.305 Some indication of what "Certain types or groups of bridges..." warrant inspection at less than 2-year intervals needs to be included here.

650.307 (b) It should be clarified that the individual in charge of a bridge inspection team is the person that actively oversees the inspection work, observing the inspection of one or more inspection crews with sufficient frequency to respond to inspector's questions, critique the methods of observation, and verify the condition ratings of the bridge inspectors doing the inspection.

650.307 (b) (2) Some criteria should to be established that gives meaning to "5 years experience." How many months of active bridge inspection qualifies as a year of experience?

650.309 The disposition of findings and results from bridge inspections needs to be addressed. Follow-up action and tracking mechanisms should be required. In 1988, the OIG recommended that FHWA require States to document bridge inspection files with data concerning all corrective actions taken in response to bridge inspection findings. FHWA still has very little in regulation covering this essential element of the program.

650.311 States should be held responsible for preparing and maintaining an inventory of all bridges under State and local agency jurisdiction including any toll authorities operating under State charter. Federally owned bridge inventories should be the responsibility of the owning agency or the responsibility of FHWA.

Section 650.301 California seeks clarification on the extent of the requirements for condition assessment for bridges that require only the 31 under record inventory items to be submitted (ie. item 5A has no on record). The typical situation where this occurs is a railroad underpass or pedestrian or pipe overcrossing. The NBIS should clarify the condition assessment responsibility of the inspecting engineer for these types of structures. The

current code language does not explicitly exclude the need for the inspector to evaluate the condition of the structure during the inventory inspection, it only limits the items of inspection data to be submitted to the FHWA.

Section 650.303 The reference to the AASHTO Manual for Maintenance and Inspection of Bridges 1983 needs to be updated to reflect the current version of this document.

Section 650.303 e (2) The underwater inspection frequency statement should be modified to allow a state to increase the inspection frequency of underwater inspections beyond 5 year intervals if the state summits appropriate justification and the FHWA approves the proposal. Likey candidates for the increased inspection frequency are culverts and other lined channels.

Section 650.307 a (2) Eliminate the qualification to be the individual in charge if the person is "qualified for registration as a professional engineer under the laws of the State".

Section 650.307 3 (b) Modify the language of this section to include the stipulation that the "individual in charge of a bridge inspection team" be physically on site during the inspection.

Section 650.311 Update the reference to the current version of the "recording and Coding Guide" or similar document.

Suggest that a minimum level of training accomplishment be set, i.e. how much training, in which course or courses, and what minimum grade achievement that would be acceptable. Also, suggest that a minimum length of on the job training (OJT) experience be required. More specific requirements are suggested here because, at present, there is considerable variation between the States as to their minimum qualifications for an inspector to perform inspections independently. With the advent of Bridge Management Systems, there are even States that are considering using only technicians, rather than trained bridge inspectors, to (simplify) (in that State's view) record quantities of elements in various condition states, and then call that an "inspection". Their thinking is that this would eliminate the need for having inspectors attend training courses and would be less costly as lesser trained individuals could accomplish the reporting. In this writer's opinion, we can never assure safe bridges for the public unless they are routinely inspected by well-trained, knowledgeable and experienced inspectors. Setting a national requirement for inspector qualification would tend to exclude the "simplistic" approach just described.

a. The materials section requires technician certification and quality control quality assurance. I think we need to require something similar to that in section 650. Provide guidance on less then 2 year frequency inspections in the regulation.

Identify structures in seismic zones, Describe type of mitigation design, Denote if seismic resistance provided by original design or by retrofit, ....

It seems that the CFR is "out of date" pertaining to the current AASHTO "Manual for Condition Evaluation of Bridges". Most references in the CFR document are based on the AASHTO "Manual for Maintenance Inspection of Bridges" 1983. The AASHTO section numbers referenced by the CFR do not match with the newer AASHTO "Manual for Condition Evaluation of Bridges".

We have made several suggestion in the past concerning the clarity of the S,I & A coding guide (especially the underrecord codes) and errors found in the FHWA "edit" program. We sent a list of items to FHWA about 1 1/2 years ago in regards to these subjects. We appreciate FHWA's

cooperation and help in resolving many of the issues. But, some issues still have not been addressed. We were wondering what the status of these issues are?

It had been mentioned to us that a group has been working on a new version of the S,I & A"code" to better clarify the intent of many items. Is this true? If so, what is the status of this group and when is a new coding guide expected to be complete?

We would be happy to meet with you in the near future concerning the NBIS questionnaire at your convenience.

A. Clarify the definition of those bridges that should be included in the inventory.
B. Revisit the limitation of span length definitions when determining if a bridge should be included.

Team Leader qualifications need to be revised to give some consideration to individuals with engineering degrees.

Streamline the process for extended inspection intervals on certain "low-risk" structures such as concrete box culverts.

We should consider establishing minimum qualifications for those who perform specialty inspections such as underwater and fracture critical.

We should consider establishing minimum vision standards for bridge inspectors.

We should consider establishing a requirement for each State to maintain a database that contains NBI data along with other pertinent data that we currently require on master lists. The database would have to have query and reporting features that would allow generation of the current master lists as well as SI&A data, etc.

*PA: Areas of NBIS that warrant further review include:*

A. Inspection of bridge structure of non-highway bridges over public roads is not required in SI&A Manual. In light of the failure of the NC racetrack ped bridge, PA is moving to require inspection reports to ensure safety to road users below.
B. Similarly, rail bridge structures over highways are not inspected under NBIS. The FRA has guidelines for inspection, but no requirements. In light of the age of rail infrastructure, this may become more critical. Further, the FRA does not require the structure condition to be reported to the State or local owners of roads they cross over. Coordination between overhead rail bridge inspections and highway owners is needed.
C. Inspection requirements for miscellaneous structures including highway retaining walls, noise walls, sign structures need to be reviewed. Funding sources for mandated inspections should be considered.
D. Need for PEs to lead Fracture Critical Member inspections
E. Need to require bridge inspection refresher courses, similar to PA's for inspection team leaders
F. Requirement for a Bridge Management System at State level. No specific BMS computer program should be mandate, only functionality.

*See work done by NBI Steering committee.*

Inspection Responsibilities: More clearly define SHA responsibilities; remove state responsibility for federally-owned bridges; clarify applicability of privately-owned bridges.

Delegation of Inspection Responsibilities: Define what can and cannot be delegated by SHA; require formal agreement for delegation.
Inspection Quality: Need requirement for QC/QA program (generic per AASHTO Manual?) & FHWA approval; define SHA & FHWA QA roles.
Load Rating: Need load rater/ reviewer qualifications; better define what "rated as to its safe load carrying capacity in accordance with ... the AASHTO Manual" means; require < 3 tons OR be closed; add posting requirements for LRFR.
Inspection Frequency: Require load posted bridges be inspected more frequently; specify timeframe for updating state inventory for inspections.
Inspector Qualifications: Specify that individual in charge qualifications apply to delegated agencies; define what a year experience means; require team leader be at bridge at all times during inspection per AASHTO Manual; require SHA to have inspector certification process & continuing training plan; explore a 3 level inspector team leader qualification; require basic 2 week training for all.
Inspection Report & Inventory: Require team leader and members be identified on bridge inspection report; address electronic recording keeping requirements and security.

If revisions are made, the Forest Service recommends that all document references be changed to "current version" rather than specific publication dates.

We would also recommend that culverts be eliminated from the definition of a bridge.

Eliminate the state be responsible for maintaining an inventory of Federal structures.

"Qualification of personnel" section needs to be rewritten. The current regulations are not resulting in acceptable uniformity of inspections among different inspectors. The changes should address: "What constitutes five years experience?", "Is an inspector with a P.E. license really qualified to perform inspections without any experience or even without taking the two-week inspector's course?", "Is an inspector who has performed two inspections a year for the last five years really qualified?", etc. The bottom line is that "Qualification of Personnel" needs to be better defined.

The frequency of inspections should be rewritten to encourage risk based inspection frequencies and address why more state DOTs are not taking advantage of the allowable 4-year inspection cycle.

The regulations should better address the inspection requirements for overhead structures (e.g. railroad and private structures).

The regulations should incorporate the Coding Guide as reference (The Coding Guide should also be updated).

The calculation of the sufficiency ratio (Appendix B of the Coding Guide) does not address bridges with low levels of service and useage (less than 20 ADT). Categoric grouping of bridges based upon level of service/useage would be appropriate.

*Personal comment: What is the State's responsibility as far as local bridges? Currently, the state is only responsible for maintaining the inventory and has no role in ensuring local bridges get inspected. It would sure be nice if we could put more responsibility on the state, but that won't happen.*

- Remove requirement that the state maintain federal bridges in its inventory.
- Clarify the expected frequency of inspections for fracture critical and other special inspection. Currently the regs are silent on this interval, yet the Coding Guide contains some frequency guidelines.

- Inspector qualifications: a. Just because a person is eligible to be registered as a professional engineer, or already is a P.E., doesn't mean they know how to inspect bridges. Suggest adding requirement that they have taken the bridge inspector's training, or equivalent, course, or have some experience inspecting bridges before they can be team leader or in charge of inspection unit. b. The team leader should be present with the team during inspections. c. Suggest different qualifications for more complicated inspections. A time frame should be specified for recording the inspection data into the state's inventory for routine inspections as well as for inspections for new, rehabbed or posted bridges.

Polling Divisions for specific items that are unclear, ambiguous, or simply non useful. I also suggest we produce a dual units to serve all our customers.

Better Clarify or eliminate 650.307 (a) (2), "Be qualified for registration as a professional engineer under the laws of the State." Update references.

Place increased emphasis in use of BMS in setting priorities for bridge work. Eliminate NBI data items that do not add value to program and add items that are worth collecting data on. Establish incentives for States or local agencies to spend a minimum amount of funds on preventive maintenance or recommended repairs. Allow for flexibility in coding guide so as not to penalize substandard new bridges where built to local standards or design exceptions, i.e. making new bridges already deficient according to the current guide.

Revise the information gathered for inventory; go to BMS and condition states for analysis and prioritization. Return to English units. Update references in NBIS and review each reference for concerns related to inspection, coding, safety, coordination between agency responsibilities for safety inspection and coding of federal owned bridges on state routes.

650.301 Application of Standards: The standards should apply to all bridges including railroad owned bridges.

650.307 Qualifications of personnel: (1) be a registered professional Civil engineer.

NBIS puts focus on the structural aspects of bridge functioning and safety. Would like some consideration requiring electrical and mechanical components, of the Nations movable bridge inventory, receive some attention.

Consider allowing states with comprehensive BMS to set their own standards within limits.

DoD installations should be able to report bridge deficiencies directly to FHWA instead of going through the State. It will reduce one extra step in the processing. Request budget for bridge inspection and repairs (be) increased. Current funding level only covers 50% of the Navy's cost of inspection and repair. Repair should include improvement incidental to repairs.

Need to clarify qualifications of inspection personnel. Should not be years in inspection as a requirement, but rather number of bridges inspected. Eligible for registration as a PE is also confusing – nobody knows what that means. Also doesn't it have to be in civil or structural engineering rather than electrical, chemical or other totally unrelated? Should also require the 3 day refresher course after a certain number of years of inspection. (Every 5 years or so). Also, Sufficiency rating calculations should be revised. S.R. does a poor job of rating structures strictly based on condition. Functional items seem to affect deficiencies much more, especially in the urban areas. We need deck geometry criteria broke out for rural vs. urban.

Revise the bridge condition rating system to become consistent and reliable. Also, once an agency submits it update disk, the time it takes to get results back from FHWA bridge division headquarters is too long. Some years it's been 3 – 6 months to hear if the data submitted per the March (annual) deadline was acceptable.

**2a. Are there technical studies or reports within or outside FHWA which support the need for these proposed changes? (e.g. a NSF study supports the need for a less frequent inspection period based on a ten year study, etc...)**
Don't know

The 2-year study of the reliability of visual inspection by the NDEVC support QA programs and having inspectors work together to improve consistency.

Possibly, I hope some (of) the work done with the BMS, seismic and scour along with other needs for bridges will provide documentation and guidance in updating the NBI standards.

Refer to FHWA publication DP-71 and the pre ISTEA Levels of Service recommendations made by FHWA.

In response to the four changes recommended:
1) The advantages of the LRFD approach to design and evaluation are well documented and are widely accepted.
2) N/A
3) N/A
4) N/A

No , but there are years of experience on deterioration of massive concrete underwater elements in fresh water. Their condition does not change in five years.

To name one, the Office of Inspector General's Report Number AS-FH-8-007 dated January 15, 1988 showed weaknesses in responses to bridge inspection findings. At that time, this weakness was largely viewed as a result of inadequate FHWA reviews. However, if the regulations were updated to more directly address the need to track and resolve bridge inspection findings, the system would be less dependent upon layers of reviews and the reviews would not have to be as contentious to accomplish the intent.

The availability of supporting documentation for the proposed changes is unknown.

Yes, Turner Fairbanks just completed a study comparing ratings that different inspectors give the same bridges.

I would expect there to be something, but I don't know.

*PA: None to our knowledge*

These proposals are primarily based on my 22+ years experience and working knowledge of the bridge inspection program.

The Forest Service has an extensive road system with a large number of culverts. Our experience has been that qualified bridge inspectors have not identified potential significant or catastrophic failures any more than maintenance personnel doing routine maintenance work.

No.

Yes, the issue of uniformity among various state inspectors was brought to attention through the recent NDVEC report that showed poor correlation among inspectors inspecting the same structures.

Not aware of any related to level of service.

Don't know, but I would guess there have been Division Office annual NBI reports that contain such suggestions.

Task force report for revisions to NBI Coding Guide, FAPG non-regulatory supplement to 23 CFR 625, July 21, 1995, Transmittal 13. AASHTO Manual for Condition Evaluation of Bridges, 2nd Edition and 2001 Interim Revisions.

None that I know of.

Our own management of the NBIS.

**3. Does the customer your office supports want to see the NBIS revised? □ Yes, □ No, □ I do not know.**

| No. respondents | Yes | | No | | Don't Know (DK) | | No Comment (NC) | | Non responsive (NR) | | Not Applicable (NA) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 43 | 24 | 56% | 8 | 19% | 6 | 14% | 1 | 2% | 2 | 5% | 2 | 5% |

No formal requests for changes to the 23 CFR have been received from our customers.

PA: Our customers include our Department Engineering Districts responsible for 16,000 NBIS bridges and approximately 1,500 municipalities that own NBIS bridges in PA

Task Force Report for Revisions to NBI Coding Guide, FAPG Non-regulatory supplement to 23 CFR 625, July 21, 1995, Transmittal 13. AASHTO Manual for Condition Evaluation of Bridges, 2nd Edition and 2001 Interim Revisions.

**3a. If the answer to number 3 is yes, can you describe the changes they would like to see?**

(The) NPS (National Park Service) and others would rather see engineers inspections than technicians as a rule.

1. Relax load rating requirements so new bridges with HS25 design load do not require load rating.

2. Extend the time for new structures, modifications, or placement of load capacity signs to double the existing requirements of 90 days for state or 180 days for local agencies.
3. Include bridges with span length of 5 m or greater under the NBIS definition.
4. Provide clear requirements about the applicability of the NBIS to Federally owned bridges and tighten the requirements to include bridges on roads open to recreation and logging, even though the agency has a "right" to close the road, if they want to.

If the NBIS is in U.S. standard units the information would be more easily used by others.

However, they are requiring professional engineers lead the field team for both above water and underwater inspections.

Please see the attached memo from _____, Bridge Inspection and Management Engineer, SCDOT ( already incorporated throughout this document).

The customers that my office supports would like relaxed inspection procedures, primarily in the form of increased inspection intervals up to five years in length.

WE FEEL THERE IS NO NEED TO REVISE THE CURRENT RULES FOR DATA COLLECTION.

Yes, Per comments from_____, Bridge maintenance Engineer, Iowa DOT. He has 30 years experience working with the NBIS. 1) Revise 650.301 to make it clear that the NBIS do or do not apply to bridges carrying railroads. Reading 650.301 and 1.6.1 (definitions of a bridge and NBIS pages 1&2) of the manual for Condition Evaluation of Bridges raises uncertainty regarding bridges carrying railroads. Are they covered by the NBIS? 2) Revise 650.305(c) to include the inspection of underwater members covered in 650.303(e)2

The North Dakota Department of Transportation Bridge Division did provide some suggested changes but they have no strong issues to present. When I discussed possible revisions to the National Bridge Inspection Standards with the NDDOT, the recommendations for changes they gave me appear to be recommendations to revise the coding guide, rather than regulation. I will present them here anyway:

The NDDOT has several Structural Plate Pipe Arches and Reinforced Box Culverts that provide access to ranch and or farm land at various locations in North Dakota. Because of the vehicular access provided, these small bridges receive coding flags for horizontal or vertical clearance and become classified as functionally obsolete structures. These structures actually are providing the service intended and the functionally obsolete designation is inappropriate.

The NDDOT has previously requested that the default mechanisms used for culverts and Item 32, Approach Roadway Width be revised. The defaults result in inconsistent and frequently unwarranted deficient status for large culverts that are operating as designed. This comment was re-directed to the team working on updating the Coding Guide in the fall of 2000.

The same as mine plus they would like to see a requirement for arms length inspection.

The following comment came from_____ Assistant Bridge Engineer at the Oklahoma Department of Transportation:

We have concerns that errors are made in the coding due to a lack of education or understanding the Pontis manuals. We also feel that there is a need for more guidelines on doing "hand on" inspections. We have missed problems because we did not use the right equipment (when is it appropriate to use the snooper -should there be a requirement when the pier gets over a certain height, you need to use the snooper).

(a) Require continuing education for bridge inspectors with an emphasis on QA/QC requirements.

(b) Update CFR footnote 1. Footnote to CFR 650.303 refers to the AASHTO Manual as Maintenance Inspection of Bridges 1983 with interims. We are presently using the Manual for Condition Evaluation of Bridges Second Edition, 1994 with interims.

(c) Provide more guidance on when to use special equipment to provide access. This may be more appropriate for the Manual, but the phrase "hands on inspection" could be added to the CFR.

Feedback from the State (Tennessee) generally supports the above recommendations. Here's what they had to say: Place more emphasis on graduate engineers as team leaders. The 2 year inspection requirement is too inflexible for culverts that are not structurally deficient. Would like to see a provision to allow these type structures to be put on a four year cycle without a drawn out approval process. Would like to see requirements that support their efforts to reduce the amount of paper involved in the inspection program. Specifically, they would like to see a firmer declaration that HBRRP funds can be used to support automation of the inspection program.

*PA: We will circulate to Districts for comments*

Bridge inspection program level management at the SHA is in substantial agreement with the need to clarify agency roles, responsibilities and delegation of those responsibilities, add QC/QA requirements, and clarify inspector qualifications.

First, they would like to put more weight of safety problems not included in any item. For example, in Puerto Rico they have problems on their bridge slabs (punching shear failure), to temporary repair the problem they install steel plates on top of the slab. This solution helps to reduce some type of accidents but can cause accidents due to slippage of vehicles over a wet steel plate.

Second, they would like to see the table on item 61 revised so it compares with the table used for items 58 to 60.

I will also suggest to create an item for Rideability (smoothness). This is a FHWA goal and I don't think that the bridge rideability is included when the pavement rideability is measured. By rating the bridge rideability the states can quantify the area / costs to correct (rehabilitate) bridges having problem with rideability.

Remove 650.307 (a) (2), "Be qualified for registration as a professional engineer under the laws of the State." Establish team member qualifications. Establish underwater inspector qualifications. Establish underwater procedures and create a diver's manual. Further define what is a unique feature.

*We believe that integrating data collection and data processing as part of National Bridge Inventory Database would have great benefits.*

*Integrate data collection and processing as a component of the national database; provide necessary features to allow users customization; web enabling the database to provide authorized users instant access to the national bridge inspection records.*

*Delete Functionally Obsolete bridges from the definition of deficient bridges and use structurally deficient bridges as the deficient bridge definition. Report deficient bridges as those that are deficient and eligible for HBRRP Funding. Today, more communities desire bridges that do not strictly meet AASHTO Standards and states are responding to those desires. MassHighway's own Footprint Program is a typical example of this. This way, the definition of a deficient bridge would be consistent. Under the current guidelines, it is possible to have bridges meet the definition of either a structurally deficient or functionally obsolete bridge but have an AASHTO Sufficiency Rating greater than 80.0. States that have large numbers of such bridges are penalized in their Bridge condition statistics, but they cannot use HBRRP funds to address these "deficiencies" nor do They receive additional HBRRP funds under the apportionment process for these bridges.*

By revising the rule as MassHighway recommends, the tabulation of bridge condition statistics would be more equal to all states, since only those bridges that are eligible for HBRRP funds and for which states receive their HBRRP apportionment would be counted

*Coding Guide Changes: MassHighway would recommend some changes to the Coding Guide in order to better reflect the type of structures, bridge appraisals and type of proposed work that we typically encounter.*

*Item 6: Increase the number of digits from 25 to 30.*

*Item 7: Increase the number of digits from 18 to 30.*

*Item 9: Increase the number of digits from 25 to 30.*

*Item 41: Needs to be better defined, since there remains ambiguity regarding the interpretation of some of the categories. Specifically for MassHighway is the issue on how to treat bridges that are partially opened to traffic due to stage construction.*

*Item 43: Should be revised to provide a separate structure type for precast concrete deck beams (also known as voided slab bridges, both adjacent (multiple) and spread. A typical cross section for this bridge is attached. These beams are different from precast concrete box beams (code 505) because they have several circular voids as opposed to the box beam's single rectangular void. Since MassHighway constructs many of these bridges, we have trouble accurately coding Item 43. We have taken to coding adjacent deck beam bridges as 501, however, this may cause confusion with actual slab bridges. Having a separate coding for this type of structure would eliminate this confusion. Also, a coding for a "Pony Truss" needs to be added, since this is a common structure type.*

*Item 106: There needs to be a better definition of those items that should be considered as "reconstruction". As the Item description now stands, there is only a list of work that is* ***not*** *considered "reconstruction".*

*Item 107:Should be revised to allow for bridge types where the top surface of the beam is also the used as the deck. In Massachusetts, precast concrete adjacent deck and box beam bridges do not have a separate deck. A bituminous concrete wearing surface is placed over a membrane directly over what is the top flange of the beam, which is designed to carry wheel loads. This situation would also be true for segmental bridges.*

*MassHighway has been coding Item 107 as 2 for such structures, however, this may cause confusion with decks that are precast slabs over stringers. Providing a separate coding for this situation would eliminate this confusion.*

*Item 58, Item 59, Item 60 and Item 62: We would recommend establishing 3 more codes for these items:*

- *X = unknown*
- *H = Hidden/Inaccessible*
- *R = Removed*

*Item 67: The name should be revised to Load Capacity Evaluation from Structural Evaluation. The Item name, Structural Evaluation has caused confusion and misinterpretation by non engineers, such as reporters and private citizens, who are looking for a single number to rate a bridge's condition. Since Item 67 primarily compares the bridge's rated inventory capacity to a standard table, it is inappropriate to call this a structural evaluation. Changing the name would help eliminate this misuse and confusion. See also the discussion for Items 68 and 69 for definition of the numerical codings.*

*Item 68 and Item 69: 1) Currently, these items are used to identify geometric deficiencies of both the horizontal and vertical underclearances (Item69) or deck width and clearance over deck (Item 68). By combining two evaluations into one item, it is difficult to identify what geometric clearance is not up to standard. MassHighway recommends that these items be subdivided so that it would be more readily apparent which clearance dimension is substandard. 2) More flexibility should be provided for coding bridges that have been designed in accordance with state or other standards, and so could be categorized functionally obsolete. For example, many bridges over railroads in Massachusetts do not meet the 21 foot clearance standard, but are adequate for the rail service they see. MBTA commuter rail requires only 18' - 3" and AMTRAK electrified lines only 19' - 5" of clearance. Replacing these bridges to obtain the 21' standard would result in significant adverse impact to the surrounding community and as a result this level of clearance improvement cannot be justified. Yet, they will be categorized as being functionally obsolete. 3) Finally, MassHighway recommends revising the definitions for the numerical codings, specifically for codings of 3 and 2, which now state "Basically intolerable requiring high priority of corrective action (for a coding of 3) or replacement (for a coding of 2)". Since these coding definitions are released to non-engineers and since these definitions are taken to be indications of structurally unsafe bridges, this language creates undue panic among the public who are presented with these definitions. Revising the definitions to be more matter of fact would eliminate the potential for misinterpretation.*

*Item 72: Providing somewhat more precise definitions for the numerical codings. Currently, the Coding Guide provides some very basic descriptions for only three coding values. Other numerical codings can be used, but they are very subjective based on the opinion of the inspector.*

*Item 75: If this Item is retained, the coding of this item should be revised, since it seems to be intended primarily towards categorizing deck widening and rehabilitation work. As a result, it does not accurately reflect the different reasons for replacing or rehabilitating a bridge. Bridge replacement and rehabilitation projects are the ones that MassHighway predominantly undertakes. We recommend that Item 75 coding be revised to identify the following projects:*

- *31: Replacement of bridge structure due to general structure deterioration or substandard load carrying capacity.*
- *35: Bridge rehabilitation due to general structure deterioration.*
- *38: Replacement of structure due to substandard bridge geometry.*

- *39: Bridge rehabilitation due to substandard load carrying capacity.*
- *40: Other structural work, including hydraulic replacements.*

*Item 36: The explanation of the coding of this item is relatively vague, which has resulted in different interpretations and codings. Since FHWA has now standardized its requirement that bridge rails, barriers and other traffic safety appurtenances, must be crash tested and approved in accordance with NCHRP 350, the coding description of this item can be revised to make it clear which types of railings merit a coding of 1 and which a coding of 0.*

*Discontinue all items in the "Proposed Improvements" section (Items: 75, 76, 94, 95, 96, 97, 114 & 115). They serve no useful purpose and are not referenced by MassHighway.*

Hawaii DOT is generally supportive of changes to the NBIS but we have not discussed at length what they would propose.

Clarification of Scour evaluations and methods to a level which establishes requirements for hydraulic calculations. (Clarification and direction for local agency's that do not have the expertise to understand what is truly required for scour analysis.)

The New York State Department of Transportation desires more flexibility in going to a four-year bridge inspection cycle. The State's previous request was denied pending meeting FHWA requirements. The State felt these requirements to be onerous. Per 1990 and 1991 Compliance memos the State submits a biannual scour report. NYSDOT feels that this report should be supplemented with a report on tidal scour and would like guidance from Washington to this effect.

Qualification of Inspection Personnel, change sufficiency rating formula so that functional items affect it less, Deck condition needs to have more affect on S.R. Keep the 4-year criteria as it is. Significantly revise Item 68, Deck Geometry – need to tie back in more to existing approach roadway width.

Clarify qualifications for bridge inspectors, allowing the states to set requirements, perhaps allowing performance testing in lieu of years of experience. Consider requiring performance testing. Require a professional engineer to be in charge of organizational unit, eliminate experience substitute for registration. Set a requirement for how soon a bridge must be load rated after it is opened to traffic. Remove the requirement for states to keep bridge data on federal bridges. Consider better defining when a bridge inspection is delinquent. Holding it to exactly 2 years does not make sense, since the NBI only reports month and year. (Note the coding guide revision committee has not gotten to this data item yet so this might change in the future.) If the 2 year requirement is strictly enforced it has the effect of moving the inspection date forward every inspection cycle. I'd say allowing 30 days would be reasonable. This is important when dealing with consultants. If the consultant consistently inspects a bridge 20 to 30 days early, this will require greater funds to pay the consultant.

**3b. If the answer to number 3 is no, can you discuss the reason why your customer does not want to see the NBIS revised?**

I haven't heard any discussion anyway or the other. Enforcing the regs is a bigger issue on the local level. Training for inspection and repairs is needed with all the inexperience and downsizing.

The NDDOT Bridge Division expressed that the regulation is working satisfactorily and they did not propose any sweeping changes. I did discuss the changes that I intended to suggest and they agreed the changes would have value if implemented.

Our customers are likely not opposed to changes in the CFR, but are not requesting changes because of a perception of the difficulty in getting suggested changes approved or a lack of knowledge of the regulations.

PA: We will circulate to Districts for comments.

*Generally satisfied with the way the NBIS is now – neither too strict or too loose.*

Comments were submitted by the Wyoming Department of Transportation by a separate submittal, but to paraphrase, the WYDOT feels the program requirements are reasonable and satisfy the needs of the bridge owners.

No, INDOT is concerned that any changes in the NBIS would result in substantial changes to the Coding Guide and the NBI database. While they support the need to revise, expand, clarify or change certain items in the Coding Guide, they believe it would require more work than they could reasonably perform. INDOT has recently converted their database from a mainframe system to an MS Access system and are still attempting to resolve many issues relating to the changeover.

It takes the State and local inspectors quite a long time to adjust their procedures and guidance to satisfy the requirements put forth by our changes. They don't see measurable benefits for them to change just for changes sake. We as an agency need to (be) alert when making significant changes that will affect our nation's bridge inspectors. They must be of value, or else we should not change.

Customers believes that the two year minimum frequency is about right. They currently have an adequate staff and maintain an inspector in training position to address attrition.

They do not keep track of the standard in detail. They rely on inputs from NAVFAC (Naval Facilities Engineering Command) on technical issues.

**4. Is the way the NBIS is currently written too restrictive? □ Yes, □ No, □ I do not know.**

| No. respondents | Yes | | No | | Don't Know (DK) | | No Comment (NC) | | Non responsive (NR) | | It depends (ID) | | Satisfied (S) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 43 | 10 | 23% | 22 | 51% | 3 | 7% | 1 | 2% | 5 | 12% | 1 | 2% | 1 | 2% |

**4a. Please discuss the reason for your response to question 4:**
Only with regard to team leader qualification

Yes in some cases. See item 2

Reason stated in 3a, 1a, plus the "not to exceed 2 years" frequency is impractical; it should state "not to exceed 26 months for any once cycle, and a 24 month average over multiple cycles or equivalent.

The state has problems keeping sufficient resources dedicated to inspections, load ratings, and maintenance of bridges. The NBIS provides fairly strict rules that keep bridges safe. The tight rules of the NBIS should be maintained and strengthened to help states keep sufficient resources allocated to bridge safety and repair.

I believe the standards are too lenient regarding the qualification of personnel.

For the most part, the NBIS requirements are reasonable. Some structures such as cast in place concrete girder bridges and culverts probably do not need to be inspected as often as every two years.

The bridge inspection programs vary amongst the State DOTs and some State's programs need more oversight than others because of the way they are set up. The need is to provide consistency in the administration of the program, therefore we need to be somewhat restrictive.

The NBIS for the intended use as a bridge safety system is adequate. It is the lack of BMS type data and misuse as a management system by today's standards that has shortcomings. It is in this manner that the NBIS are restrictive.

Generally speaking, my answer to question 4 is no. The NBIS provides guidance in all aspects of the inspection program. Detailed guidance is by reference (AASHTO Manual, Bridge Inspector's Training Manual, etc.). The information contained within these documents provides reasonable guidelines to ensure an effective program and, if implemented properly, will result in reasonably safe and reliable structures. Inspection procedures, recording, and reporting are general enough to allow a level of detail commensurate with the size and use of most bridges. Qualifications of personnel are the minimum I would want to see for individuals involved in the inspection program. Evaluation procedures follow well established practices. Engineering judgment is allowed (at least implicitly) to implement the guidelines reasonably.

The exception would be in the case of an organization that maintains an inventory of small, lightly used bridges. The strict compliance with NBIS could lead to an inefficient and costly program.

The requirement that underwater members shall be inspected not to exceed five years is too restrictive for some bridges.

Bridge inspection is a matter of national public safety and confidence. Regulations must be able to withstand heavy scrutiny of the public, the press and oversight organizations.

Additionally, as FHWA becomes more and more understaffed in the face of growing duties and responsibilities, the regulations need to be adjusted in some areas to reduce program dependency on FHWA reviews. The regulations should be clearer and, in some cases more restrictive, so less time and effort are required to achieve adequate bridge safety. As new managers arrive on the scene in the State transportation agencies, we have had to debate the same bridge inspection issues that were the source of criticism of FHWA management of bridge inspection in the 70's and 80's. In some areas, we have lost ground that had been gained because we lack sufficient regulation and are dependent on old memoranda and technical advisories that lack regulatory support.

Some sections appear to be restrictive to the point that sound engineering judgement cannot influence compliance with the guidelines. Other sections need to tighten up the code language to ensure the safety of the bridges in the nation.

The NBIS have been utilized with considerable success for a number of years. They have resulted in some degree of uniformity among the States, though not enough to assure uniform inspector qualification. Their usage over many years has also resulted in an amazing degree of effectiveness in assuring safe bridges for public use, though perhaps not without load limitations where necessary. The "bath water" doesn't need to be thrown out, but it needs "cleaning up".

Yes, With respect to inspection frequency and team leader qualifications.

*PA: Bridge safety inspection practice in PA is much more rigorous than NBIS. We feel this additional info is needed to effectively manage our bridge assets*

I don't see the question of the NBIS being too restrictive or loose as relevant to the need for revision. There currently is, and needs to continue to be, plenty of flexibility for an agency's bridge inspection program; the NBIS should be a generic standard that any program must adhere to.
The one partial exception to this is I believe there is a need to have a multi level of inspector qualification. Under the current NBIS, the same qualification applies to both the Golden Gate Bridge and a 6.2 m long multi pipe culvert carrying 10 ADT.

The requirements in the NBIS for inspectors are reasonable and have been successfully implemented in the Forest Service. Inspection requirements have also been successfully implemented and proven to be adequate. However, application of these standards to culverts does not seem to be appropriate given the very low potential for a catastrophic failure of a culvert under service load.

No, Generally, the provisions provide the framework for an acceptable program.

The sufficiency rating calculation groups bridges of all levels of service together so that bridges that would be adequate for low service level (less than 20 ADT) may compare poorly to bridges that may be inadequate for high service level.

*The NBIS contains sufficient detail to administer a bridge inspection program without being overly restrictive. I would not recommend removing anything.*

Sometimes, there are bridges that used to be in main roads but with the construction of new roads they become of second importance. Those bridges still get low SR (sometimes lower than 50) due to geometry but because of the change in the road use there is no need for that to remain as a deficient bridge.

I don't think they're restrictive enough.

They are open somewhat for different interpretations, but still retain basic "Core" data that can be used for national comparisons.

*Yes, In some cases.*

There are not many complaints from inspectors and bridge engineers managing the program that overall NBIS is overly restrictive or also too loose. I believe the programs have done well to ensure bridge safety for the traveling public.

No, standards seem to be functioning adequately.

No, based on longevity of the program.

No, It covers bridges being used by the general public.

Don't want to leave too much room for interpretation, because you will get more and more non-uniformity.

There are too many bridges which have low sufficiency ratings but are not FO or SD.

I'd say they are too vaguely written.

**5. Is the way the NBIS is currently written too loose? □ Yes, □ No, □ I do not know.**

| No. respondents | Yes | | No | | Don't Know (DK) | | No Comment (NC) | | Non responsive (NR) | | Satisfied (S) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 43 | 15 | 36% | 16 | 38% | 3 | 7% | 1 | 2% | 7 | 16% | 1 | 2% |

*PA: While we believe in a more rigorous program, we are not prepared to dictate standards to other states.*

*Yes, In some cases.*

**5a. Please discuss the reason for your response to question 5:**
My experience with several states does not indicate a problem in this area.

The rules are too loose in load rating requirements, inspection of movable bridges, and QA requirements.

Yes see 4 a (I believe the standards are too lenient regarding the qualification of personnel.)

NBIS provides a system for assuring an accurate understanding of the sufficiency of an owner's bridges and requires a reasonable amount of effort to maintain. Improvements should be made to the existing NBIS on a continuous basis, but a totally new system is not necessary.

All bridge inspectors should be certified not just the Team Leaders. It is in this manner that the NBIS are loose.

See response to question 4. The NBIS is general enough to cover most bridges. I believe some engineering judgment is required to implement the standards in a reasonable manner. Engineering judgment cannot be regulated and if not exercised judicially, can be disastrous.

The qualifications to do inspections are too easy to meet. They do not require any quality control on the part of the bridge owner. There is no requirement for inspectors to get continuing education and there is no guidance on removing an inspector's eligibility to do bridge inspections.

I believe that there are a whole category of structures that could pose a safety hazard that are not inspected. For example, structures less than 20 feet long that do not meet NBI bridge definitions.

*PA: Bridge safety inspection practice in PA is much more rigorous than NBIS. We feel this additional info is needed to effectively manage our bridge assets.*

- *State bridges 8'-20' long are inspected with same intensity as NBIS bridges*
- *Our formal statewide QA program is very comprehensive*
- *Our Observed Scour Assessment program is well suited to our bridges where many foundations are unknown and theoretical scour calculations would be cost prohibitive.*

All structures can be characterized using NBIS.

*We need more guidance about the frequency of in-depth inspections for fracture critical bridges.*

I think they accomplish the ultimate goal of keeping the Nation's bridge inventory regularly inspected.

Compliance with standards has had a positive influence (on) public policy.

Too many questions on how to interpret many of the items.

I'd say because of the vagueness with which they are written.

**6. What question would you ask that has not been asked?**

Should the NBIS requirements and FHWA allocation of HBR funding be based entirely on element level inspection, or continue to be based on the NBI condition ratings ?

Although not mandated as was planned in ISTEA, most states saw the need for a bridge management system (BMS) even though some complained about the initial deadlines. Today however, a few states have actually developed bridge programs for several program years using BMS and most others are getting close. It seems that on the national scale as a whole FHWA is not pushing BMS like it once was. Only in certain state is it receiving proper support. Why not nationally as a useful tool in managing our bridge infrastructure?

This is not a question but an important suggestion. With many States adopting bridge management systems, which involves collecting element level condition state information for maintenance and management purposes, there still needs to be a strong focus on the importance of continued "safety" inspection performance to assure public safety. A BMS is not a substitute for bridge safety inspection. It is a complementary function, convenient to be performed by an inspector while at the bridge. The NBIS should probably incorporate (recognize) the BMS concept and its purpose, and then go on to strongly affirm the need to continue "safety" inspection, whether or not a BMS is being utilized.

Can you make bridge management decisions with the data? The answer is no. It is not consistent enough and docs not provide enough information about the bridges to make selections or decisions. It can not be used by bridge engineers to show the public what our real needs are.

What can be revised, added, or removed to improve the quality of inspections?

Have any problems developed with the bridge inspection program that could have been avoided with additional or revised regulations?

Should small structures less than 20 feet, overhead light/sign structures, high mast lighting structures be covered by the NBIS.

*You may want to go through the regulation section-by-section to solicit more specific feedback. Provide multiple choice items to solicit input on existing or proposed modifications to the regulations (i.e., areas to be added or deleted).*

How about an alphabetical index and better reference to SD/FO included in (the) new guide?

Would the STA continue with a bridge inspection program if the NBIS were discontinued? Is the investment required to comply with the NBIS cost effective? Would you prioritize your resources differently if the NBIS did not exist? Is the Nation's Highway System safer due to the NBIS?

Who is responsibile for federally owned bridges in the state system and who is responsible for the inventory of ; state parks, national parks, other state agencies (DNR) which own bridges and have funding for inspections.

Where is (it) clearly stated in the text that NBIS standards apply to DoD installations?

Need to define reconstruction better for Item 106 – very different among states.

Need to find out if all the inventory items still need to be collected or are some totally useless.

Would like the manual in English since our state in back to English.

Should we require NBIS inspections on structures less than 20' in length – there are a lot out there that aren't inspected and are in poor shape. They can collapse too.

If there are some inspectors out there that aren't technically qualified, but have taken the 2 week training course, they should be able to do inspections as team leader as long as there is a documented formal review of his inspection reports by a qualifed supervisor or engineer-in-charge. There are good inspectors out there that don't have their 5 years of inspection yet. – need some leeway.

Put back in a rating for the approaches. Too many are rough and this affects the impact loading at the bridge ends.

**7. What question(s) would be appropriate to ask via an advanced notice of proposed rulemaking (ANPRM) of those using the NBIS, 23 CFR 650 subpart C?**

Does the NBIS, as currently constituted provide adequate assurances for safety of public bridges ? Should the NBIS be extended to certain privately owned bridges or Federally owned bridges, on roads that appear to be open to public travel ?

With GASB statement 34 on the horizon, asset management clearly is a move toward a more preservation oriented philosophy. Will FHWA adapt funding needs and apportionment to this approach. Is it possible to solve the political funding puzzle while applying sound bridge management techniques? Some states are more new construction oriented, some maintenance, some a combination of both. Do you think that GASB Statement 34 will bring a more consistent philosophy to the states and therefore nationally. The following is thought to ponder: It is my understanding that in order for countries to receive transportation infrastructure loans form the World Bank, they must implement a BMS. Go figure.

Do you believe the data accurately and consistantly reflects the condition of your bridges? What decisions can you make based on the data?

Perhaps a question about what could be revised in the NBIS to better assist agencies to better manage their bridge inventories.

Should small structures less than 20 feet, overhead sign structures, high mast lighting structures be covered by the NBIS? Many states now have inspection programs that cover these items...should the NBIS regulation cover these items to ensure some minimum coverage and uniformity?

Does the Coding Guide need to be updated?

*No recommendations, since I am not familiar with the rules of writing ANPRM's, including what the limitations may be for the content.*

What responsibility level are the states willing to assume regarding local bridge inspections?

How should the cost incurred by inspection agencies to implement a new coding guide be reimbursed?

*What is an estimated total annual cost to comply with the NBIS ? See questions above.*

**Miscellaneous Comments:**

We are finding deterioration, particularly underwater that we have not seen before. This deterioration needs to be evaluated by personnel qualified to determine the cause, evaluate the structural significance of the deterioration and recommend appropriate repairs.

Items that Illinois DOT would like to change:

a) The coding guide says to collect % truck traffic if ADT is 100 or greater. IDOT wants this raised to 250 or more. It seems unnecessary to go through effort of collecting truck info for those very low volume roads

b) IDOT would like S.R. calculations revised to allow waterway adequacy to have more effect on the S.R. Right now it has little effect. We have some structures that are inadequate due to hydraulics, but they are not HBRRP eligible because S.R. does not drop low enough.

c) The coding guide requires the collection of Future Average Daily Traffic data (Item 114) to represent traffic counts projected 17 to 22 years into the future. for the same section of roadway, the HPMS requires projects of 18 thru 25 years into the future. This difference in reporting requirments places a burden on the state inventory personnel to effectively and efficiently comply with these conflicting requirements.